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Introduction

Artificial intelligence and robotics for reducing patient mortalities through outpatient department (opd) services in hospital

Abstraction

artificial intelligence (ai) and robotics are transforming outpatient department (opd) services by improving early disease detection, patient triage, appointment management, diagnostic accuracy, and referral systems. delayed diagnosis and overcrowding in opd clinics contribute to preventable hospital mortalities. this paper reviews the role of ai and robotics in reducing mortality through efficient opd management. evidence suggests that ai-assisted clinical decision support and robotic technologies can improve patient outcomes by identifying high-risk patients earlier and reducing delays in treatment. however, challenges including cost, ethical concerns, data privacy, and workforce training remain significant.

Introduction

hospital outpatient departments are the first point of contact for many patients. increasing patient volume often results in delayed diagnosis, prolonged waiting times, and missed opportunities for early intervention. artificial intelligence and robotics provide innovative solutions by automating patient registration, predicting disease severity, supporting physicians in diagnosis, and facilitating timely referrals. these technologies have the potential to reduce mortality through improved efficiency and evidence-based decision-making.

Methods

a narrative literature review was conducted using published articles indexed in pubmed, sciencedirect, and peer-reviewed healthcare journals. studies published between 2018 and 2026 were reviewed. keywords included "artificial intelligence", "robotics", "outpatient department", "hospital mortality", and "clinical decision support". articles focusing on ai-assisted diagnosis, robotic healthcare systems, and mortality-related outcomes were included

Research

the reviewed literature demonstrated that ai systems improve patient risk prediction, prioritize critically ill patients, and enhance diagnostic accuracy. robotic systems assist in patient navigation, automated screening, and hospital logistics, reducing delays in clinical care. hospitals implementing ai-supported workflows have reported improvements in treatment efficiency and reductions in preventable mortality associated with delayed care. however, the magnitude of benefit varies depending on hospital infrastructure and staff training.

Discussion

artificial intelligence and robotics have significant potential to improve outpatient services by enabling earlier diagnosis and faster clinical decision-making. these technologies may reduce mortality through better patient prioritization and workflow optimization. despite these advantages, barriers such as implementation costs, limited technical expertise, algorithm bias, and concerns regarding patient privacy continue to affect adoption. future research should focus on multicenter clinical trials and cost-effectiveness analyses to determine long-term impacts on mortality

Conclusion

artificial intelligence and robotics can strengthen outpatient department services by improving early diagnosis, reducing waiting times, and supporting clinical decision-making. wider implementation, supported by healthcare policies and professional training, may contribute to lower preventable hospital mortality while improving the quality and efficiency of patient care

Reference

1. rajkomar a, et al. scalable and accurate deep learning for electronic health records. 2018.

2. revolutionizing care: the dynamic duo of ai and robotics in healthcare. intelligent hospital. 2025.

3. benefits and harms associated with the use of ai-related algorithmic decision-making systems by healthcare professionals. the lancet regional health europe. 2025.

4. hospital ai and robotics adoption, access inequality, and county mortality: a national study. medrxiv. 2026.